

WHAT IS CLAIMED IS:

1. An apparatus for sealing a passage through tissue communicating with a body lumen, comprising:

an elongate member having a proximal end, a distal end, and  
5 a lumen extending between the proximal and distal ends defining a longitudinal axis;

a plug member disposed on the distal end of the elongate member, the plug member comprising a helical thread on its outer surface, the plug member comprising a distal port therein in communication with the lumen; and

a locator member extendable distally from the distal port, the locator member comprising an elongate deflectable element comprising a proximal end and a distal end, and a control element coupled to the distal end of the deflectable element, the control element being movable proximally for causing an intermediate portion of the deflectable element to buckle substantially transversely with respect to the longitudinal axis.

2. The apparatus of claim 1, wherein the deflectable  
20 element comprises a helically wound wire extending between the proximal and distal ends of the deflectable element, and wherein

the control element comprises a tether extending along an outer surface of at least a portion of the helically wound wire.

3. The apparatus of claim 2, wherein the intermediate  
5 portion of the deflectable element has a cross-section in its buckled configuration that is larger than a cross-section of the distal port.

4. The apparatus of claim 1, wherein the plug member  
comprises a passage therein extending between the distal port and the lumen.

5. The apparatus of claim 4, further comprising a sealing  
member disposed in the passage for substantially sealing the  
15 passage from fluid flow therethrough.

6. The apparatus of claim 1, wherein the plug member is  
releasable from the elongate member.

20 7. The apparatus of claim 6, wherein the elongate member comprises an actuator for releasing the plug member from the distal end of the elongate member.

8. The apparatus of claim 6, further comprising one or more connectors on at least one of the distal end of the elongate member and the plug member for releasably securing the plug member to the distal end of the elongate member.

9. The apparatus of claim 6, wherein the plug member comprises bioabsorbable material.

10. The apparatus of claim 1, wherein the locator member and the elongate member comprise cooperating feedback elements for identifying when the locator member is inserted a predetermined through the elongate member.

11. An apparatus for positioning a closure device within a passage through tissue communicating with a body lumen, comprising:

an elongate member comprising a proximal end, a distal end, and a lumen extending between the proximal and distal ends defining a longitudinal axis;

a closure element associated with the elongate member for sealing the passage; and

5 a locator member extending through the lumen, the locator member comprising a distal portion extending distally beyond the distal end of the elongate member, the distal portion comprising an elongate deflectable element comprising a proximal end and a distal end, and a control element coupled to the distal end of the deflectable element, the control element being movable proximally for causing an intermediate portion of the deflectable element to buckle substantially transversely with respect to the longitudinal axis.

12. The apparatus of claim 11, wherein the deflectable element comprises a helically wound wire extending between the proximal and distal ends of the deflectable element, and wherein the control member comprises a tether extending along an outer surface of at least the intermediate portion of the helically wound wire.

20 13. The apparatus of claim 12, wherein the intermediate portion of the deflectable element has a cross-section in its

buckled configuration that is larger than a cross-section of the distal port.

14. The apparatus of claim 11, further comprising an actuator on a proximal end of the elongate member, the actuator coupled to the locator member, the actuator configured for moving the control element proximally for buckling the intermediate portion of the deflectable element.

15. The apparatus of claim 11, wherein the elongate member and the locator member comprise cooperating detents for substantially securing the locator member axially with respect to the elongate member when the locator member is fully inserted into the elongate member.

16. The apparatus of claim 11, further comprising a housing slidably disposed on an exterior of the elongate member, the housing configured for releasably holding the closure element, the housing being actuatable for advancing the closure element distally towards the distal end of the elongate member for deploying the closure element.

17. The apparatus of claim 11, wherein the closure element comprises a clip deliverable from the elongate member, the clip configured for engaging tissue adjacent the passage.

5 18. The apparatus of claim 11, wherein the closure element comprises a plug member disposed on the distal end of the elongate member, the plug member comprising a thread pattern on its outer surface.

10 19. The apparatus of claim 18, wherein the plug member is releasable from the elongate member.

15 20. The apparatus of claim 18, wherein the plug member comprises bioabsorbable material.

21. An apparatus for delivering a closure element into a passage communicating with an opening into a body lumen, comprising:

an elongate member comprising proximal and distal ends;

20 a housing slidably coupled to the elongate member, the housing configured for releasably holding a closure device;

10 a locator member coupled to the elongate member, the locator  
member having a distal portion extending distally beyond the  
distal end of the elongate member, the distal portion comprising  
a helically wound wire comprising a proximal end, a distal end,  
5 and an intermediate portion therebetween, and a control element  
coupled to the distal end of the helically wound wire, the  
control element being movable axially for causing the  
intermediate portion of the helically wound wire to buckle  
substantially transversely with respect to the longitudinal axis.

15 22. The apparatus of claim 21, wherein the control element  
comprises a tether extending along an outer surface of at least  
the intermediate portion of the helically wound wire.

20 23. The apparatus of claim 21, wherein the elongate member  
and the locator member include cooperating detents for  
substantially securing the locator member axially with respect to  
the elongate member.

24. The apparatus of claim 21, further comprising an  
actuator coupled to the housing, the actuator configured for

advancing the housing distally to deploy a closure element therefrom.

25. The apparatus of claim 21, further comprising a closure  
5 element located within the housing.

26. The apparatus of claim 25, wherein the closure element comprises a clip.

27. A method for sealing a passage communicating with a  
body lumen using an elongate member comprising proximal and  
distal ends, and a closure element deployable from the distal end  
of the elongate member, the method comprising:

coupling a locator member to the elongate member such that a  
15 distal portion of the locator member extends distally beyond the  
distal end of the elongate member;

advancing the distal end of the elongate member through a  
patient's skin towards the body lumen via the passage until the  
distal portion of the locator member is located within the body  
20 lumen;

buckling a deflectable element on the distal portion of the locator member from an axial collapsed configuration to a transverse expanded configuration;

manipulating the elongate member until the deflectable element in the expanded configuration contacts a proximal wall of the body lumen, thereby providing a tactile indication of a location of the distal end of the elongate member relative to the body lumen; and

deploying the closure device from the distal end of the elongate member within the passage.

28. The method of claim 27, further comprising withdrawing the elongate member and the locator member from the passage, leaving the closure element to substantially close the opening.

29. The method of claim 27, wherein the elongate member comprises an introducer sheath, and wherein the method further comprises introducing one or more instruments through the lumen of the sheath into the body lumen.

30. The method of claim 29, further comprising performing a diagnostic or therapeutic procedure using the one or more instruments at a location accessed via the body lumen.

5 31. The method of claim 27, wherein the body lumen comprises a blood vessel, and wherein the procedure comprises at least one of angioplasty, atherectomy, stent delivery, delivery of a therapeutic agent, and tissue ablation.

32. The method of claim 27, wherein the deflectable element comprises a helically wound wire, and wherein the buckling step comprises directing a control member coupled to a distal end of the helically wound wire proximally.

15 33. The method of claim 27, wherein the closure element comprises a plug member coupled to the distal end of the elongate member, and wherein the deploying step comprises releasing the plug member from the distal end of the elongate member.

20 34. The method of claim 33, wherein the plug member comprises a distal port communicating with a lumen in the elongate member, and wherein the step of coupling the locator

member comprises inserting the locator member into the lumen of the elongate member until the distal portion extends through the distal port of the plug member.

5           35. The method of claim 34, wherein the step of releasing the plug member comprises withdrawing the locator member from the distal port, and wherein the plug member comprises a sealing member to substantially seal the distal port from fluid flow therethrough.

10           36. The method of claim 33, wherein the plug member comprises an external thread pattern, and wherein the advancing step comprises rotating the elongate member in a first direction to thread the plug member into the passage.

15           37. The method of claim 36, wherein the manipulating step comprises rotating the elongate member in a second direction to direct the plug member away from the body lumen.

20           38. The method of claim 27, wherein the deploying step comprises advancing a housing distally along an exterior of the

elongate member, the housing having the closure device detachably held thereto.

39. The method of claim 38, wherein the housing is movable  
5 between a proximal position and a distal position, the distal position being a predetermined distance from the deflectable element in its expanded configuration.

40. A method for sealing a passage communicating with a  
body lumen using a tubular member comprising proximal and distal  
ends and a lumen extending therebetween, and a closure element  
deployable from the distal end of the tubular member, the method  
comprising:

15 advancing the distal end of the tubular member through a patient's skin into the passage towards the body lumen;

introducing a locator member into the lumen of the tubular member until a distal portion of the locator member extends beyond the distal end of the tubular member;

20 buckling a deflectable element on the distal portion of the locator member from a collapsed configuration to a transversely expanded configuration within the body lumen;

manipulating the tubular member until the deflectable element in the expanded condition contacts a proximal wall of the body lumen, thereby providing a tactile indication of a location of the distal end of the tubular member relative to the body

5 lumen; and

deploying the closure device from the distal end of the tubular member within the passage.

41. The method of claim 40, wherein the locator member is introduced into the lumen of the tubular member before the distal end of the tubular member is advanced into the passage such that the distal portion of the locator member is advanced through the passage into the body lumen during as the distal end of the tubular member is advanced into the passage.

42. The method of claim 40, wherein the locator member is introduced into the lumen of the tubular member after the distal end of the tubular member is advanced into the passage.

20 43. The method of claim 40, wherein the closure element comprises a plug member disposed on the distal end of the elongate member, and wherein the deploying step comprises

releasing the plug member from the distal end of the elongate member.

44. The method of claim 43, wherein the plug member  
5 comprises an external thread pattern, and wherein the advancing step comprises rotating the elongate member in a first direction to thread the plug member into the passage.

45. The method of claim 44, wherein the manipulating step comprises rotating the elongate member in a second direction to direct the plug member away from the body lumen.

46. The method of claim 27, wherein the deploying step  
15 comprises advancing a housing distally along an exterior of the elongate member, the housing having the closure device detachably held thereto.

47. A method for sealing a passage communicating with a body lumen, the method comprising:

20 introducing a locator member into the passage until a distal portion of the locator member extends into the body lumen;

buckling a deflectable element on the distal portion of the locator member from a collapsed configuration to a transversely expanded configuration within the body lumen;

manipulating the locator member until the deflectable  
5 element in the expanded condition contacts a proximal wall of the body lumen; and

advancing a closure device into the passage along the locator member until the closure device is disposed at a predetermined location relative to the distal portion of the locator member;

returning the distal portion from the expanded condition to the collapsed configuration; and

withdrawing the locator member from the passage, leaving the closure device in the passage.

48. The method of claim 47, wherein the step of introducing the locator member comprises:

disposing a tubular member through a patient's skin into the passage until a distal end of the tubular member is disposed  
20 proximate the body lumen;

introducing the locator member into a lumen of the tubular member until the distal portion of the locator member extends beyond the distal end of the tubular member into the body lumen.

5        49. The method of claim 48, further comprising withdrawing the tubular member from the passage before advancing the closure device into the passage.

10       50. The method of claim 48, further comprising introducing one or more instruments through the lumen of the tubular member into the body lumen.

15       51. The method of claim 47, wherein the step of advancing a closure device comprises advancing an elongate member having the closure member thereon into the passage over the locator member, and wherein the method further comprises deploying the closure device from the elongate member at the predetermined location.

20       52. The method of claim 51, wherein the closure device comprises a plug member, and wherein the step of advancing a closure device comprises threading the plug member through the passage to the predetermined location.

53. The method of claim 52, wherein the plug member is disposed on a distal end of the elongate member, and wherein the step of deploying the closure device comprises releasing the plug member from the distal end of the elongate member at the predetermined location.

54. The method of claim 51, wherein the locator member and the elongate member comprise cooperating elements for identifying when the closure device reaches the predetermined location.

55. The method of claim 54, wherein the cooperating elements comprise a marker on the locator member having a predetermined relationship with the distal portion of the locator member.

56. The method of claim 51, wherein the step of advancing a closure device comprises advancing a housing along the elongate member until the closure device reaches the predetermined location.